

## Remarks

Claims 1-9, 12-20, 22, 23, 25, 26, 28, and 29 remain in the application.

The Examiner has rejected claims 1, 3, 6-8, 10, 11, 16, 20, 22, 23, and 25-29 under 35 U.S.C. §102(b) as being anticipated by Samoilov et al. (US Patent 6,455,814, hereafter Samoilov). The restriction of claim 5 has been incorporated into claim 1, that of claim 21 into claim 20, and that of claim 27 into claim 25. Claim 11 has been canceled in favor of claim 12. Accordingly, the anticipatory rejections of claims 1, 10, 20, and 25 are moot.

The rejection of claim 3, now rewritten in independent form is traversed. Samoilov is silent on the edge exclusion zone, which is understandable since he is supporting the wafer from its backside and the edge exclusion zone is on the wafer front side. Samoilov does not explicitly describe his support structure but his susceptor 106 appears to be a nearly solid plate and not a ring. Samoilov describes his lift pins 105 as “passing through holes in the susceptor 106,” (col. 3, ll. 23, 24) and he also describes “backside heating of the wafer 102 from the susceptor 106,” (col. 3, ll 46, 47). That is, Samoilov’s susceptor 106 performs the function of its name in that it absorbs radiant energy from the radiant heating lamps 102 below it and converts the energy to convective heat to be transferred to the wafer 116 it supports above on its entire backside. Such a function is not performed by a ring confined to the edge exclusion zone.

The rejection of claim 27, now incorporated into claim 25, is traversed. As argued above, Samoilov supports his wafer over substantially its entire backside. Samoilov does not disclose a support ring.

The Examiner has rejected claims 2, 4, 5, 9, 12-15, 17-19, 21, and 24 under 35 U.S.C §103(a) as being obvious over Samoilov in view of Ballance et al. (US Patent 6,090,210, hereafter Ballance). This rejection is traversed. The Examiner is picking and choosing parts of two complementary thermal processing chambers without any suggestion in the art for the combination.

The Examiner would apparently substitute Ballance’s ring support disposed between the

wafer and pyrometers for Samoilov's solid susceptor disposed between the wafer and the heat source. The Examiner presents no reason for the substitution. The purpose of Ballance's ring-shaped support is to expose the wafer backside to a blackbody cavity formed between it and the reflector. In contrast, Samoilov places his black body cavity above the wafer between it and reflector above (col. 3, ll. 58-65). It would be nearly impossible to form a black body cavity on the bottom of his wafer since that is the direction from which the radiant energy originates. A black body reflector is the opposite of Samoilov's quartz dome 114.

Further, as stated above, Samoilov heats his wafer through the solid susceptor disposed between the bottom of the wafer and the radiant heating lamps. Substituting Ballance's support ring for the susceptor would entail a major change in the method of operation without any suggestion for the advantages of such a change. Placing a ring between Samoilov's wafer and susceptor would defeat the entire purpose of Samoilov's susceptor being used to conductively heat the wafer.

It is not even clear what is the combination proposed by the Examiner, that is, where are the radiant source and the blackbody reflector and in whether the wafer's front surface faces up or down. In any case, no obvious combination can include supporting an inverted wafer on its front side, a configuration totally unsuggested in the art and contrary to both the applied references. That is, only in hindsight would Ballance's wafer 16 be inverted to conform to the geometrical relationships of Samoilov.

Similarly, amended claims 1 and 8 require the process side of the wafer to face downwardly. The art is silent on such an orientation. In somewhat different language, claim 12 requires the radiant heating apparatus face the wafer back side and be above the wafer. Again no art has been presented for this configuration which unobviously combines the complementary structures of Samoilov and Ballance.

Claims 3, 13, and 17 relate the support structure with the edge exclusion zone. While edge exclusion zones are well known. However, no art relates the support structure to the edge exclusion zone. The Examiner attempts to justify restricting the support structure to the edge as exposing more of the wafer's backside to be exposed and downwardly facing via conductive


heating. This argument needs to be withdrawn. First, Samoilov teaches conductive heating through his solid susceptor. Reducing the susceptor to a ring reduces Samoilov's conductive heating and substitutes radiant heating. Secondly, both Samoilov and Ballance support their wafers on the back side so that the edge exclusion of the front side is not directly relevant. The art simply fails to teach the relationship of a backside support with the front side edge exclusion zone.

Claim 20 now requires that a ring support a peripheral portion of the substrate on a side of the radiant heat source. While Ballance discloses a peripheral ring support, it is on the side of the reflector and on the wafer back side. As argued above, the peripheral ring support is needed to create a wide blackbody cavity on the support side. There is no need for a wide blackbody cavity on a side of the radiant heat source and indeed such seems to be impossible.

Dependent claim 15 recites a detachable holding member for holding the substrate from its top. No art has been shown for such a member.

In view of the above amendments and remarks, reconsideration and allowance of all claims are respectfully requested. If the Examiner believes that a telephone interview would be helpful, he is invited to contact the undersigned attorney at the listed telephone number, which is on California time.

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